R E P O R T R E S U M E S

ED 019 733 EA 001 317

THE FORMAT AND PROCESSING OF INFORMATION IN THE SELECTION PROCESS.

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PUB DATE 8 FEB 68

EDRS PRICE MF-$0.25 HC-$0.48 10P.

DESCRIPTORS- *TEACHER SELECTION, *DECISION MAKING, *INFORMATION UTILIZATION, *INFORMATION PROCESSING, EMPLOYMENT INTERVIEWS, CHICAGO,

THIS PAPER DISCUSSES FACTORS IN THE ACQUIRING, PROCESSING, AND UTILIZING OF INFORMATION IN TEACHER SELECTION, AND DESCRIBES TWO INDEPENDENT VARIABLES IN AN EXPERIMENT ON TEACHER SELECTION--NUMBER OF DOCUMENTS AND MASKING OF INFORMATION. THE DISCUSSION FOCUSES ON SELECTION STRATEGIES, VALIDITY OF INFORMATION, CURRENT PRACTICES OF GATHERING AND UTILIZING INFORMATION, AND THE EXPERIMENTAL VARIABLES. IT IS FOUND THAT THE SELECTION STRATEGY IS A MAJOR FACTOR IN DETERMINING WHAT INFORMATION WILL BE GATHERED AND HOW IT WILL BE UTILIZED. AN IMPORTANT VARIATION IN SELECTION STRATEGIES IS THE DEGREE TO WHICH THESE STRATEGIES FOLLOW THE CLINICAL OR ACTUARIAL APPROACH. IT IS THE CURRENT PRACTICE TO FOLLOW THE CLINICAL APPROACH WITH EMPHASIS ON THE INTERVIEW. THE TWO EXPERIMENTAL VARIABLES APPEAR TO BE RELEVANT TO A NUMBER OF FACETS OF SELECTION DECISIONMAKING, INCLUDING THE AMOUNT OF TIME IT TAKES TO MAKE THE DECISION AND THE EFFECTIVENESS IN UTILIZING INFORMATION. THIS PAPER WAS PRESENTED TO THE ANNUAL MEETING OF THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION (CHICAGO, FEBRUARY 8-10, 1968). (HW)

ED019733

AMERICAN EDUCATIONAL RESEARCH ASSOCIATION
Annual Meeting, February, 1968

Symposium:

Information Variables Affecting Decisions Regarding the Selection of Teachers *

Chairman:

Glenn C. Boerrigter, U.S. Office of Education

Participants:

Situational Factors to be Considered in the Selection Process
Dale Palmer, University of Washington

Personality and Behavioral Characteristics Pertinent to Selection Teachers
Michael Hickey, University of Washington

✓ The Format and Processing of Information in the Selection Process
Donald Bauthues, University of Washington

The Effect of Various Information Formats on Decision to Select Teachers
Dale L. Bolton, University of Washington

Discussant:

Julian C. Stanley, Johns Hopkins University

EA 001 317

* The research reported in this symposium is supported by the U. S. Office of Education, Grant No. OEC 4-7-061349-0266, Variables Affecting Decision Making in the Selection of Teachers. Director: Dale L. Bolton.

THE FORMAT AND PROCESSING OF INFORMATION IN THE SELECTION PROCESS

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The selection process depends upon the amount and kinds of information available. No less important in arriving at a selection decision is the format and processing of the information. The purpose of this paper is to discuss factors affecting the gathering, processing, and utilizing of information in teacher selection and to describe two independent variables in an experiment on teacher selection. More specifically, the discussion will focus on: (a) selection strategies, (b) validity of information, (c) some current practices of gathering and utilizing information, and (d) the experimental variables: number of documents and masking of information.*

Selection Strategies

The strategy for selection determines, to a large extent, the nature of the data gathering, information processing, and decision-making procedures used. Perhaps the first dimension of a selection strategy is its purpose. That is, what kind of statement will it lead to regarding the candidates' relative qualifications for a position. Will the strategy lead to an ordered ranking of all candidates, or an approval-reject list? Is it designed to select the "global" teacher, or certain types of teachers for specific situations? Is it specifically designed to select the best candidate, or merely an acceptable candidate?

Another dimension of a selection strategy is the degree to which it relies on clinical or actuarial methods for assessing the applicants' qualifications. In their pure, theoretical form, the clinical and actuarial methods are on opposite ends of a continuum. The continuum consists of many methods that combine elements from both the clinical and actuarial approaches, but in differing degrees.

"The clinical position," states Scott (1964), "is that each human organism presents a unique structure or pattern of behavior. This pattern consists of a dynamic combination of traits, abilities, motives, and values. To describe that unique individual adequately and to predict his behavior, the primary objective is to develop observational techniques that respect this uniqueness and lead to

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* This paper does not discuss techniques, such as card sorting and electronic data processing, for storing and retrieving information on a large number of applicants for the purpose of identifying those that are qualified for a particular position. Rather, the concern is with the gathering, processing, and utilizing of information on an individual applicant to assess his qualifications for a particular position.

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understanding (an appeal to values) the individual." As it pertains to the selection of teachers, the clinical approach is based on the assumption that both the individuals and the job are too complex to be adequately investigated and described by the statistical analysis of isolated variables. Basic to this assumption is the idea that there are many different teaching approaches and classroom interaction processes which lead to comparable end results. Teaching behavior is considered to be an outgrowth of inner variables which can best be assessed by projective techniques and the personal interview. The result is usually a verbal description of the teacher's personality and a prediction of his future success in the position for which he is being considered. The description and prediction are usually general statements, expressed in terms of global teacher characteristics.

The actuarial approach, in contrast, is based on the careful definition and measurement of performance outcomes, the measurement of molecular variables believed related to these outcomes, and empirical evidence which indicates the relationship between the predictor scores and criterion measures. Scott states that, "The Actuarial position accepts the fact that behavior may consist of a pattern of interrelated variables, but insists that behavioral dimensions are held in common among individuals, although in varying degrees."

An advantage of the actuarial approach, properly applied, is that it forces a careful search for different dimensions of teaching success. Once this has been done, predictor variables can be validated for the separate relatively independent and differentially important dimensions that will most likely be found.

A purely actuarial approach is not possible in situations where the number of meaningful relationships between predictor scores and criterion measures that have been validated by research is not sufficient for good decision making. Valid relationships between predictor scores and criterion measures are difficult to establish if the job is new or if there is a small number of workers in the job category. However, aspects of the actuarial approach can usually be applied if desired. The greater number of validated predictor-criterion relationships, the more actuarial the selection decision can be. If sufficient relationships have been established and if appropriate weights for the predictors have been determined for making an optimum selection decision, the decision can be completely actuarial.

Another dimension of a selection strategy is the method used to incorporate the many bits of information obtained on an applicant into a cumulative index or judgment of the applicant's qualifications. This can be done in a number of ways, five of which have been outlined by Toops (1945). These methods may be followed most precisely when the actuarial approach is applied. However, they may also be followed, in general, when using the clinical approach. The methods are:

1. The summation-of-characteristic-scores method. By this method bits of information are grouped according to the characteristic to which

it is believed they relate. A score is thus derived for each characteristic being considered. The characteristic scores are then added for a total score. The gross scores may be summed, or the scores may be weighted and then summed.

2. The successive hurdle method. The successive hurdle method is especially useful if validity coefficients for the position have been determined. Then the successive hurdles can be applied in descending order of their validity until the desired number of applicants remain.

3. The precise profile method. This method is used when certain levels of the characteristics and qualities evaluated are deemed essential for success on the job, so that if the applicant does not have precisely the skill-pattern, or profile, he should not be considered. Obviously, a favorable selection ratio is a prerequisite for utilization of this method. A variation of this method is the "this-or-more" method, which is essentially establishing cutting scores.

4. The minimum divergence from desired profile method. By this method every candidate is compared with the ideal profile, and a measure of his disparity from that profile is obtained. The top candidate is the one with the minimum divergence.

5. The predominant or outstanding merit method. Each candidate is screened for predominant or outstanding characteristics or qualities. This method gives unusual weight in selection to those persons who possess unusual excellence in more than one characteristic. It is the antithesis of the method of establishing minimal scores. It is assumed that particular strengths will compensate for other possible weaknesses. Although undoubtedly a good procedure if the required job behavior calls for unique strengths, this method can easily become a means of employing biases.

After a plan for incorporating bits of information into judgments of the applicants' qualifications has been determined, the next question is one of what information should be sought.

Information Validity and Utility

Whatever the selection strategy used, it is the amount of relevant information available which determines the completeness of the picture of the applicant's abilities and characteristics. Thus, the most pertinent question for the decision maker continually to ask is: what evidence shows best the relationship between certain measured or judged human qualities and different job behaviors?

A large number of studies have been conducted to ascertain the characteristics or combination of characteristics that are closely associated with teacher competency. It was hoped these characteristics could then be used to predict successful teaching. Review of the literature on this subject reveals that in most cases the relationships between the teacher characteristics studied (characteristics such as intelligence, knowledge of subject matter, professional knowledge, culture, teaching attitude -- all as defined and measured by the various studies) and measures of teacher effectiveness were non-existent, low, or showed considerable disparity (Fattu, 1963). The results of most studies indicate that none of these predictors taken singly would be very suitable for selection purposes. However, one should not assume that this indicates a lack of applicability of actuarial methods to the teacher selection process.

A major reason for the low correlations obtained in many studies has been low reliability in criteria used for teaching effectiveness. If predictors and criteria are not measuring the same factors, the common variation is expected to be low. Another reason for obtaining low correlations is that the correlation coefficient yields a meaningful index of the relationship between only linear variables. High correlation coefficients will not be obtained between two non-linear variables unless the total range of the variables is divided into sections in which the variables are linear and separate coefficients are calculated for each section.*

Broadly speaking, the validity of selection batteries for a single class of predictors may be limited by: (a) their making distinctions not relevant to the job, (b) their failure to make relevant distinctions, (c) unpredicted changes that take place in the individual over time, (d) lack of reliability in judging the quality of work performance, and (e) unpredicted differences occurring in the nature and conditions of work (Bransford, 1967). Ghiselli and Haire have reported research giving evidence that the validity coefficients of various selection tests for different criteria vary over time. They conclude that "the practice of using perfromance data obtained during an initial period and letting it stand for ultimate or total performance completely ignores the dynamic character of the criterion and important changes that are taking place in the worker's performance" (1960, p. 226).

Elements of Current Practices

In order to determine the nature of current teacher selection practices, structured interviews were conducted with personnel directors in twenty school

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* One approach to identifying subgroups of differentially predictable persons has been called configural scoring by Dunnette (1966) and Actuarial Pattern Analysis by Lykken and Rose (1963). For an example, consider the variables education and experience. Each of these two variables can be tested for its predictiveness. However, by the configural method each variable is sub-classified. In this case, education could be classified into 2 groups (B.A.s and Masters) and years of experience into 3 groups (1-3, 4-9, and 10 or more) to from 6 subgroups. The idea is to subgroup a set of predictors such that each of the groups is relatively homogeneous in regard to the pattern of job behavior shown. Then separate predictions can be made for each group.

districts. Questions were asked regarding the general selection procedure, the nature and relative importance of their criteria, and the individuals involved in the selection process. While the overall procedure varied from district to district, there was much similarity. In all districts, the selection strategy followed a clinical approach. In nearly all cases information concerning the applicant was obtained from three basic sources: the application form, the interview, and the credentials from the college placement office. In some cases additional information was obtained from references listed on the application form. There were important differences, however. The districts varied considerably in: (a) the number of people involved in assessing the applicant's qualifications, (b) the locus of decision responsibility on whether or not an applicant would be hired, and (c) the relative weight of the criteria applying to the selection.

Biographical Data

Biographical information represented a large proportion of the information that was accumulated on each applicant. Biographical information is gathered with the belief that relevant past behaviors are good predictors of future performance. There is probably considerable merit in the use of biographical information for prediction purposes. However, as Dunnette states, "it is difficult to know exactly how past behaviors relate to specific future behaviors that may be of interest. . . The nature and extent of the information attained differ from applicant to applicant; predictions must be based on varying knowledge with the usual result that they can be little more than vague impressions, subjective hunches, and intuitive feelings" (1966, p. 65).

How are biographical data reviewed for job behavior predictions? The clinical approach is to assess the bits of information and project them into patterns of consistent behavior. On the basis of these patterns of past behavior, judgments are made regarding the applicant's personality and characteristics, and subjective predictions are made as to how he will most likely react in future situations. The actuarial approach, which none of the districts used, is to first standardize the biographical items. The separate items are then empirically compared against defined job behaviors.

In practice it appears that biographical information is often used to determine whether the applicant passes the initial selection hurdles. For those who do, other means, especially the interview, are used to determine final selection.

Interview

The school personnel surveyed indicated that they rely heavily upon the interview, especially as a means of assessing personality. Many research studies have found the interview either unreliable, invalid, or both.

Other studies have shown that it can be a useful predictor of behavior (Yonge, 1956). The value of the interview depends upon its purpose and form, and the skill of the interviewer; unfortunately, in practice, the validity of the interview is too often assumed.

References

Professional references vary considerably in reliability and validity. A recommendation from a person very familiar with the applicant under circumstances which test those behaviors relevant to the job may be highly valuable. But recommendations are often worthless, either non-discriminating among individuals or misleading. Personal references requested by the district should be obtained on a standard form if there is intent to validate them. Some practitioners and some writers on selection procedures believe that a telephone check is a better procedure than mailing reference forms. Their reasons seem logical.

The Experiment

In the teacher selection experiment which is the focus of this symposium, four independent variables relating to information format were manipulated. Two of these variables involved the utilization of information on written documents.

Documents

One variable was the number of documents, and one level of this variable was multiple documents. Data gathering devices used by school districts were analyzed by format and the type of information they gathered. On the basis of this analysis, documents typical of those used by school districts were created for the experiment. At the same time, it was intended that the documents represent the most reasonable of current practices. To accomplish this the literature was searched for empirical evidence, and opinions were solicited from an advisory committee.

The multiple documents consisted of : (a) an application blank; (b) college placement credentials which included general information, a report on student teaching, a summary of coursework including grades, and letters of recommendation from professors, supervising teachers, and principals; and (c) a confidential teacher reference form from a principal or superintendent.

A second level of the number of documents variable was a single or summary document. It is relatively easy to construct a single document on which one can summarize the information obtained on forms initiated by the district -- application blank, reference form, interview form -- because the categories of information are standardized by the use of these same forms for all applicants. The difficulty lies in making a form on which one can appropriately summarize the information contained on the various forms initiated outside the district,

such as college placement credentials and letters of recommendation. In the different forms and letters a district receives there will be a great variation in subject content, characteristics described, and descriptive adjectives and phrases used. However, a logical analysis of the different kinds of information given and the various descriptive terms used indicates that many different means are being employed to describe the same qualities and characteristics, a conclusion supported by the research of Tupes and Christal (1961) and Peres and Garcia (1962).* Therefore, it seems reasonable that a single document can be constructed on which one can appropriately summarize nearly all relevant bits of information received on a candidate.

A major guideline in creating the summary document was to minimize the information categories in nominal form and maximize those in scalar or rating form. Of the four areas on the form -- General Information, Background Data, Summary of College Work, and Evaluative Data -- only in the "General Information" section are the data recorded in nominal form. In the other three sections, information is recorded on a five column rating grid.

In the section on "Evaluative Data" an applicant could be rated on 25 characteristics pertaining to personal qualities and teaching behaviors. Information contained in the credentials, student teaching report, and letters of recommendation was assessed and recorded on this grid. A code consisting of both letters and colors was used so that the persons looking at the grid would know the source of the original evaluations.

For a school district to use the summary form, it would, of course, have to define each characteristic or behavior item on the document. It would also have to establish a policy as to what constitutes a particular rating for a particular characteristic or behavior. Although initially it would be considerable work, the required careful examination of hiring policies would most likely be very beneficial.

Masking

Another variable in the experiment was masking. The motive for masking was based on the belief that it is time consuming to study each bit of information; and since a person has difficulty assimilating large amounts of data, it may be better to direct attention to only those bits of information that are most discriminating. There were three levels of masking: (a) none, (b) partial, and (c) considerable. With partial masking, all the "average" data was masked out. With considerable masking all "non-exceptional" data was masked out.

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* Eight factor analysis studies of ratings on personality characteristics have been summarized by Tupes and Christal (1961). The same five factors of typical behavior emerged from all studies. In a study of 625 letters of recommendation by Peres and Garcia (1962), it was found that applicants were not described in terms of observable behavior (i.e., critical incidents) but rather by adjectives or generalized trait names. The 715 adjectives found in the letters were reduced to 170 by personnel people. A factor analysis of these 170 adjectives identified 5 factors much the same as those identified by Tupes and Christal.

Both the summary document and the multiple documents were masked, so it was necessary to provide for consistent masking of the information on the two levels of documents. The summary document was masked first. For partial masking the central column on the rating grids was masked out, leaving two columns at each extreme. For considerable masking, only a single column at each extreme was left unmasked. Masking on the multiple documents was derived from the masking on the summary document by utilizing records of correspondent information made at the time of the initial transfer of information from the multiple documents to the single documents.

The masking was done to determine the effect on decisions of allowing the decision maker to attend to only the more exceptional information. In practice, school districts might develop different ways of providing the decision maker with only exceptional data.

SUMMARY

This paper has discussed factors in the acquiring, processing, and utilizing of information in teacher selection. A major factor in determining what information will be gathered and how it will be utilized is the selection strategy. An important variation in selection strategies is the degree to which they follow the clinical or actuarial approach. Although the clinical approach is easy to apply and there is some evidence that it can be improved by training, it would seem that there is a definite limit to its improvement possibilities. On the other hand, the actuarial approach, although it has not been well developed and is more difficult to establish, appears to have greater potential. It is the current practice to follow the clinical approach with great weight given to the interview.

Two variables in a teacher selection experiment were described. These variables were number of documents and masking of information. These variables appear to be relevant to a number of facets of selection decision making, including amount of time it takes to make the decision and effectiveness in utilizing information.

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